

FIG. 2

```
1984 LUW4 LUW4
                                <u>- 4 w 4 </u>
                                            - α ω 4
                                                         4 W N 4
                                                                    4 0 0 4
                      251
251
251
251
249
                                 351
351
343
343
          301
301
301
299
          π - < <
                     ଅ≻ດດ
                                ≺ ≶ ≶ ≶
                                             \circ \circ > >
                                                        Ͳ⋛⋛⋛
                                                                   0022 <->-
          > < Z Z
                                  ଜଜଜଜ
                                                       \Box \times \Box \circ
> > > >
           < 70 70 70
                      > - m >
                                  ~ ~ ~ ~
                                                         0000
                                                         < < - -
           ס ס כ ס
                                  x = x = x
                                             8 8 8 8
                                                                               \omega \rightarrow -\infty
                       \neg \omega > >
                                  \mathsf{m} \circ \mathsf{m} \circ
                                                         чхωх
                                                         < < < < <
                                                                               > r o ⊼
           סיסיס ⊲
                                  ପ୍ରଜ୍ଞ
                                             ଦଦଦଦ
                                                                    т пр то
                      BOOD
                                  aasa
                                                                               QQQU
                       מממם
                                  עטטס ⊳
                                             пппп
                                                         mrro
                       \neg \prec \prec \prec
                                  < < < <
                                             ଜଜଜଜ
                                                         \Gamma
                                                                    \Gamma
                                                                               \dashv \triangleright \triangleright \triangleright
\neg
                      ≺ ¬ ≶ ≶
                                             IDDD
                                                                    _____
           0>>>
                                 מדעת
                                                                               > - - <
          သတတတ
                      σρππ
                                  < < < <
                                             ____
                                                         ---
                                                                    m m m m
                      < » <del>-</del> -
                                  \neg \neg \circ \circ
                                            >>>>
                                                         \prec \prec \prec \prec
                                                                               < < < <
           ~ $ $ $
           <<<<
                      ଜନଜନ
                                סרסס
                                             > < < <
                                                                    ଜଜଜଜ
                                                         >>>>
                                             OZZZ
                      0000
                                  ଦଦଦଦ
           ZIII
                      Z Z Z Z
                                  < 3 0 3
                                             σπασ
                                                                    < < < -
                                             \neg \circ \circ \circ
                                  ----
                                                                    \omega \omega \omega
                       \neg \neg \prec \prec
                                                        രെരെ
           \neg \neg \neg
                                                                    ***
                                                                               \Omega \dashv \dashv \dashv
           ଜଜଜଜ
                      9999
                                 ⊁ດບບ
                                             മെമെ
                                                         \mathsf{C}\mathsf{C}\mathsf{C}\mathsf{C}\mathsf{C}
                                             o⊢zz
                      തെതെ
                                  > m > >
                                                         סססס
                                                                    \dashv \dashv \dashv
                                                                               סססס
                                                                               3 - - -
                                  m m m
                                             ס א ה ס
           \dashv \dashv \dashv
                      രെരെ
                                  > > > >
                                             \neg \neg \prec \prec
                                                        9999
                                                                    \dashv \dashv Z \dashv
           \sigmaz\sigma
                                                        пг – <
                                 \prec \prec \prec \prec
                                                                               x m o x
           ଦେବବ
                      $ $ $ $
                                             m m m m
                                                                    ⊁ດດດ
           птпп
                      \mathsf{m}\,\mathsf{m}\,\mathsf{m}\,\mathsf{m}\,\mathsf{m}
                                 ଦଦଦଦ
                                             QMZQ
                                                         ם מים מ
                                                                    ⊣<<<
                                  -<<<
                                             \neg \prec \triangleright \triangleright
                                                         0000
                                                                               \alpha\alpha\alpha
                      o \le \le \le
           രെഗര
           >> o o
                      \prec \prec \vdash \vdash
                                 x x x x
                                             3333
                                                        m \circ o m
                                                                    രെഒര
                                                                               \mathbb{R} G \times G
           \prec \prec \prec
                      > o z z
                                  - 88
                                                         < < < <
                                                                    > ™ ດ ດ
                                             \sigma \times \neg \neg
           <-<<
                                  o ⊣ o z
                                                         0 \dashv \dashv \dashv
                                                                    ~ ~ 0 0
                                                                               סססס
                      ≺ ≶ ≶ ≶
                                             ₽mz⊢
           ><>>
                       סססס
                                  ωω<<
                                             \dashv \prec \not \not \not \not \not \not
                                                        0000
                                                                    രെരെ
                                                                   > = -
           пппп
                      _ _ _ <
                                 > 0 - 0 <
                                             < < <
                                                        ZQXZ
                                                                               3 3 3 3
           <-<-
                                             глгг
                       - z x m
                                 0000
                                                         <0>>
                                                                               > > > >
                                                                    スーカカ
                                                                               < < < <
           סססס
                      m \rightarrow p \rightarrow p
                                  - 3 3 3
                                             ZQQF
                                                        \times \omega m \omega
           \rightarrow m m m
                       S D Q Z
                                  \vdash < > >
                                             סססא
                                                         2---
                                                                    ១១១១
                                                                               > > > >
                                                         ק≲רר
                                             \neg
           z m x z
                      ≻େo∽⊣
                                  x x x z
                                                                    _{\rm O} - _{\rm m} _{\rm m}
                                                                    m <u>द</u> − −
           Q \times \times Q
                      r < - <
                                  ππξξ
                                             のススス
                                                        \neg \Omega \pi \pi
                       _ - - <
                                 ⊣ <u>₹</u> < <
                                             ____
                                                         < < ¬ ¬
                                                                    mzχσ
                                                                               * < < <
                                                                    ____
           ⊁ດດດ
                      >>zm
                                  m o o z
                                             IO>0
                                                        \prec \prec \prec \prec
                                                                               \sigma \sigma m \sigma
                                  >>>>
                                             IIII
                                                         QQQK
                                                                    \sigma z \sigma \sigma
                                                                               ଜଜଜଜ
                       രെയര
                      zwww
                                  zzzz
                                             \dashv \dashv \dashv \dashv
                                                        IDZZ
                                                                    0000
                                                                    ₹₽₽₽
           3 2 2 2
                      SODO
                                 3 3 3 3
                                             ≺⋾⋛⋛
                                                        $ $ $ $
                                                                               ס ס ס כ
                                                                    < < < <
                       σΖυυ
                                 ໑໐໐>
                                                         9999
                      > 0 x x
                                 ע ע ס ≻ ס
                                             DITZ
                                                         סססס
                                                                    S \dashv \dashv \dashv
                       <-<<
           7777
                                             <-<<
                                                         <000
                                                                    0 11 2 21
                                  O m o m
                                                                               zzəə
           \pi \times \pi \rightarrow
                       0 D D D
                                    \sigma I Z
                                             סססס
                                                         ≺ ≷ ≷ ≷
                                                                    \mathtt{r} \prec \prec \prec
                       ----
                                    -<<
                                                         x \vdash \triangleleft \sigma
                                                                    ≺≺≨π
                                             mm o x
           zzoo
           \prec \prec \prec
                       Q X > >
                                  ൈറെ⊳
                                             တတ္တေသော
                                                         ססס⊲
                                                                    סססס
           סססס
                      > v > v
                                                                    ≲ m m ∑
                                  ozmo
                                             > \leq m m
                                                        စ္စစ္စ
                      z 71 - -
                                             maa-
                                                                    ----
                                                                               >>>>
                                  > 0 x >
                                                         \dashv < > \dashv
           - - - - -
           סססח
                       סעט
                                  \triangleright \times \dashv \circ
                                             D O X D
                                                         エヹスヿ
                                                                    x \dashv \dashv \dashv
                                                                               2000
           ><>>
                       < < > <
                                             ZZZI
                                                        ממגג
                                                                    ଜନଜନ
                      ⊣ m < >
                                             \prec \prec \prec
                                                        ØZFF
                                                                    \sigma\sigma\sigma\sigma\sigma
           ממממ
                                 ススのス
```

FIG. 3

QQm⊢ mm∢g >>>>

>>>>

3334 ≻≻≻≻

ω > z >

4 2 2 4

Citrobacter

cloacae freundii

Enterbacter

Yersinia enterocolitica

Klebsiella pneumoniae

P05364 P05193 P45460 Q48437

(SEQ

NO:

1 2 3 4)

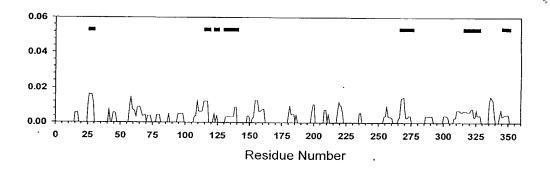


FIG. 4C

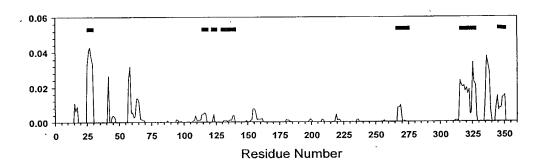


FIG. 4D

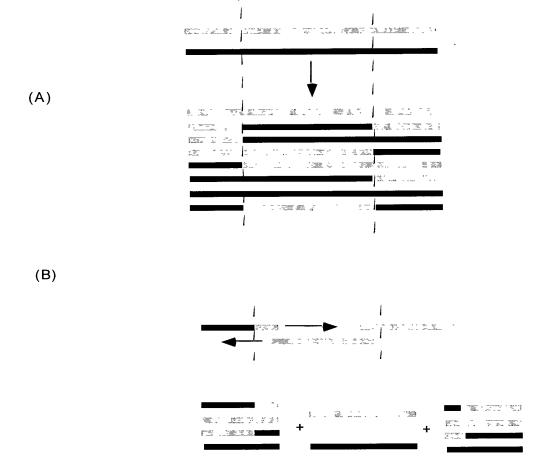


FIG. 7

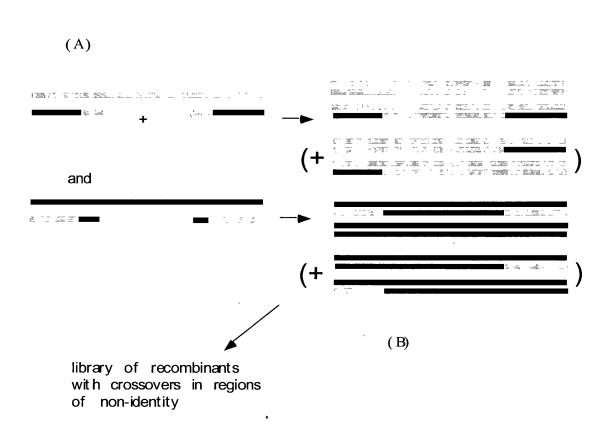
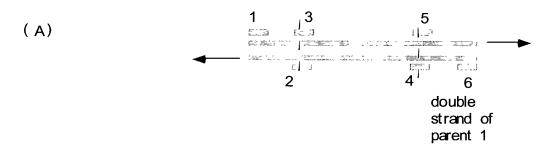


FIG. 8





(B)

Reassemble fragments in a pool, by PCR with 1+ 6

FIG. 9

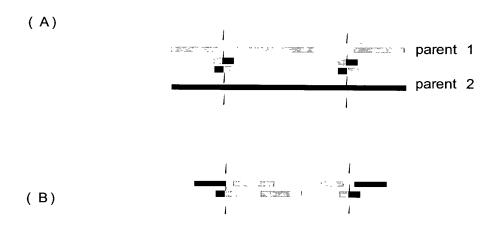
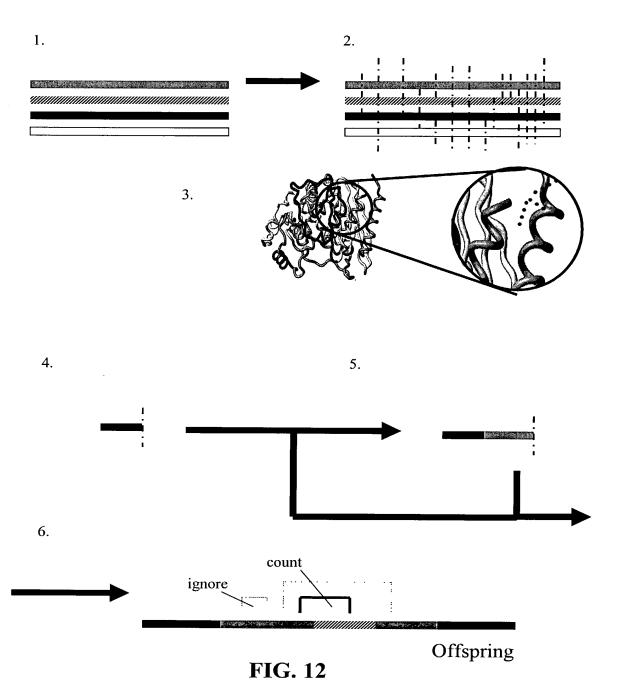


FIG. 10

Recombinant search algorithm



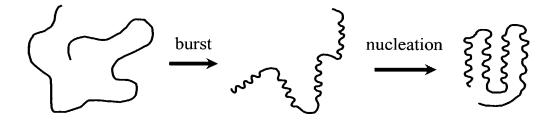


FIG. 18

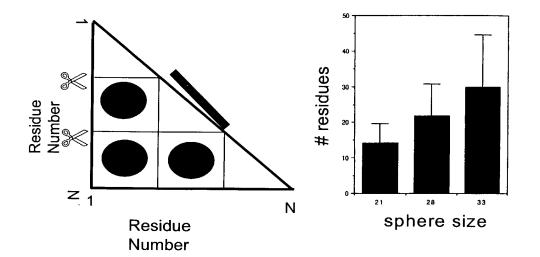
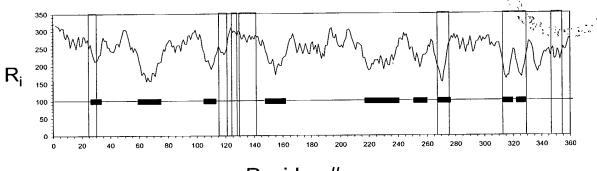


FIG. 19



Residue #

FIG. 22



Rejected

Fragment size is less than 15



O

Accepted

Fragment is > 15 residues and fits into the sphere



O

Accepted

Fragment is > 15 residues and fits into the sphere



Rejected

Fragment does not fit into the sphere

FIG. 23